DETERMINATION OF EXPLOSIVE POWER IN THE 400 M HURDLES EVENT CADETS

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Abstract: For some disorder, such as diabetes, the only special instructional arrangements that may be necessary are in physical education. When this occurs, special education funds can be used to support these services. Regardless of the funding amount or source, every effort should be made to insure that appropriate physical education experiences are provided for students with health impairments. The need for physical activity and benefits to be derived from these services will justify the expenditure of fund and energy.

Keywords: Diabetes mellitus, insulin, obesity, physical exercises program.

1. Introduction

In the last two decades of years, performance runners developed by modeling training after senior training algorithms in terms of volume and their intensity, and by perfecting the art of hurdlers pointing running speed crossing the hurdlers up close to senior levels.

Standard techniques for crossing the hurdles remains a theoretical concept in training and competition as each junior is running according to the individual level of training. The development objective of the power in general and particularly explosive power of a runner at 400mh actually means to harmonize and implement them in training program to be thinking much sense of responsibility of the coach.

Adaptation length and speed amplitude contact with the ground at the distance of 35m from 9 hurdle from hurdle 2 to 9 is due to changes in internal powers due to fatigue starts to install, but also by external powers caused by wind, quality runway influences opponent. For an athlete confirmed, even at the age of 16-17 years, explosive strength endurance is the result of aggregation power resulting from the report of duration of eccentric and concentric contraction allowing evidence of powers elastic component [1, 4, 5]. In this respect, for the legs, with jumps in depth training is designed for athlete training plan to - and develop both vertical acceleration and the horizontal and lactacid strength during the course is determined by resistance exercise of a certain vertical

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powers and / or horizontal to the ground. Therefore, much of the jumping exercises, including: triple jump without take off, five steps without take off, ten steps without take off, jumping type “countermovement jump” consist of vertical components and / or horizontal in form, complexity and diversity, developing both vertical component and horizontal component of power.

Athlete shall be an explosive power as high acceleration to overcome gravity, their own body weight while a jump to make as good \[2, 3\]. Based on these assumptions, in our research we want to identify the explosive power during before competition period a junior athlete in the age of 16.2 years, runner 400mh, vice national champion in 2004.

2. Organization of research

Research is a case study. The period is “between” April 15 to May 15, 2005, during which took place every 8 workouts per week. We illustrate the main means of training:

- **Monday: 9.00: Power with 10 tones: genuflexion, walking lunge, lifting the bank \((h = 40cm)\), torn; 17.00: 3 x 12 x jump deep \((h = 50-40-30cm)\) 3 x 6 x 100m \(I = 90\%\), break: 1min, Break: 5min.
- **Tuesday: from the place: 5 x five steps take off on the left leg., 5 x five steps take off per right leg. 1 x 500m with 14 hurdles placed at 17.5 m distance, break: 5min, 2 x 500m with hurdles 5, 6, 7, 8, 9, 10 break: 6min., 1 x 500m.
- **Wednesday: 35min. with increasing tempo in turn, power (for the development of abdominal and back muscles).
- **Thursday: 5 x five steps take off, 5 x ten steps, 5 x 300m \(I = 90\%\) (with hurdles 1, 2, 7, 8) break: 5min.
- **Friday: idem Monday morning training. Afternoon: deep jumps idem Monday and 3 x 6 x 60m \(I = 95\%\), break 1min., break: 5min.
- **Saturday: 2-bit jump. Over 10 hurdles \((h = 0.91 m)\) to 3 feet away, 2 x 5 x 150m \(I = 95\%\) break: 2min, Break: 7min.Sunday: rest.

On Tuesdays, Wednesday, Thursday, Saturday, the sportsmen have make sample Miron Georgescu, after training, after - noon, while on Mondays and Fridays to be made after training this morning (the power). Miron Georgescu clear that evidence such as energy resources highlights of a sporting driving characteristics of basic strength, speed, explosive power in a power-speed maximum effort in the triple extension. Were carried out every 15 jumps (in shoes) on two legs, right leg and then on the left, is considered the best 10 attempts in the 15 jumps, software giving us the average maximum power \((W / kg)\), height of flight, speed drill, the coefficient of variability in energy and coefficient of variance structure. We will look only unitary anaerobic power \((W / kg)\). The Miron Georgescu method was introduced in sports assessment in 1953. After many years of experiments, it was improved by a group of specialists (I Stupineanu, O. Ciubotaru and P. de Hillerin). Hillerin, in 1999, managed to improve it and to introduce two new assessment indicators and terms, the accomplished maximum power \((PMr)\) and the maximum possible power \((PMp)\).

Presentation of results:
The parameters studied in training (Monday-Wednesday)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Monday I</th>
<th>Monday II</th>
<th>Tuesday</th>
<th>Wednesday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week I</td>
<td>-1,8-1,9</td>
<td>-</td>
<td>-1,55+1,78</td>
<td>-1,43 1,65</td>
</tr>
<tr>
<td>Week II</td>
<td>0,01</td>
<td>-</td>
<td>-1,10</td>
<td>-1,15</td>
</tr>
<tr>
<td>Week III</td>
<td>0,70</td>
<td>-</td>
<td>-0,49</td>
<td>-0,01</td>
</tr>
<tr>
<td>Week IV</td>
<td>1,73 - 1,84</td>
<td>-</td>
<td>0,40 0,50</td>
<td>0,46 0,57</td>
</tr>
</tbody>
</table>

Resources

<table>
<thead>
<tr>
<th>Week I</th>
<th>Power (t)</th>
<th>reps 100m</th>
<th>reps 500m (with hurdles)</th>
<th>r.t.v.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12,8-12,3s</td>
<td>1,25 – 1,23min</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Week II</td>
<td>-</td>
<td>12,3-12,0s</td>
<td>1,20 – 1,19min</td>
<td>-</td>
</tr>
<tr>
<td>Week III</td>
<td>-</td>
<td>12,1-11,6s</td>
<td>1,17 – 1,15min.</td>
<td>-</td>
</tr>
<tr>
<td>Week IV</td>
<td>Deep jumps</td>
<td>13,70-13,90m (right)</td>
<td>13,80-14,10m (left)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Deep jumps</td>
<td>14,00-14,15m (right)</td>
<td>14,10-14,38m (left)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Deep jumps</td>
<td>14,07-14,26m (right)</td>
<td>14,11-14,34m (left)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Deep jumps</td>
<td>14,27-14,49m (right)</td>
<td>14,40-14,71m (left)</td>
<td>-</td>
</tr>
</tbody>
</table>
The parameters studied in training (Thursday-Saturday)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Thursday</th>
<th>Friday</th>
<th>Friday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>Week I</td>
<td>-1.60-1.80</td>
<td>-1.04</td>
<td>-</td>
<td>-1.01</td>
</tr>
<tr>
<td>Week II</td>
<td>-2.06-1.89</td>
<td>-0.86</td>
<td>-</td>
<td>-1.61</td>
</tr>
<tr>
<td>Week III</td>
<td>-2.50-2.78</td>
<td>-0.79</td>
<td>-</td>
<td>1.25</td>
</tr>
<tr>
<td>Week IV</td>
<td>-3.17-3.21</td>
<td>-0.17</td>
<td>-</td>
<td>1.47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resources</th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>reps. 300m</td>
<td>power</td>
<td>reps</td>
<td>reps 150m</td>
</tr>
<tr>
<td>(with 8 hurdles)</td>
<td></td>
<td>(t)</td>
<td>60m</td>
<td></td>
</tr>
<tr>
<td>Week I</td>
<td>44,5-43,9s</td>
<td>-</td>
<td>7,6-</td>
<td>18,8-18,4s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>7,2-</td>
<td></td>
</tr>
<tr>
<td>Week II</td>
<td>43-41,8s</td>
<td>-</td>
<td>7,1-</td>
<td>18,6-17,9s</td>
</tr>
<tr>
<td>Week III</td>
<td>41,6-40,8s</td>
<td>-</td>
<td>7,0-</td>
<td>18,2-17,6s</td>
</tr>
<tr>
<td>Week IV</td>
<td>39,5-37,8s</td>
<td>-</td>
<td>6,8-</td>
<td>17,9-17,4s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Results Running (min.-max.)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Five steps take off jump*</td>
<td>-</td>
<td>Deep jumps</td>
<td>2-foot jump over hurdles</td>
</tr>
<tr>
<td>Week I</td>
<td>14,40-14,86m</td>
<td>-</td>
<td>Deep jumps</td>
<td>2-foot jump over hurdles</td>
</tr>
<tr>
<td>Week II</td>
<td>14,90-15,10m</td>
<td>-</td>
<td>Deep jumps</td>
<td>2-foot jump over hurdles</td>
</tr>
<tr>
<td>Week III</td>
<td>15,00-15,10m</td>
<td>-</td>
<td>Deep jumps</td>
<td>2-foot jump over hurdles</td>
</tr>
<tr>
<td>Week IV</td>
<td>14,90-14,98m</td>
<td>-</td>
<td>Deep jumps</td>
<td>2-foot jump over hurdles</td>
</tr>
</tbody>
</table>

* Correlation insignificant at p> 0.05 (r = -0.243)

3. Discussions

In the two tables (no. 1 and no. 2), we presented on the stage before the competition period four weeks of the results of the main means used in training and values of the difference between power unit on both legs (PUBL) and sum of the unit on foot Left and right: PUF- (PUR + PUL) expressed in W / kg. We interpret the results according to the scale of values developed by the National Research Institute for Sport:
in terms of strength training for athletes normally prepared, the value of PUA-
(PUR + PUL) is -1, lack of training pointing at to the values between -1 to 0, or
positive and the excess power reaching values between -1 -. -2, and if the values of
the differences are between -1.40 -. -1.50, can keep the same power, but training must
be geared towards speed. If values are going to -2, have low load power and
worked mostly for speed.

As noted in the two tables, sportsman shows, mostly in the first week studied
values between -1.9 to -1.65 [PUA-(PUR +
PUL)] which shows that the preparation of
power is excessive. Analyzing the results
following 3 weeks, the highest value of
power is found at around -2, (-1.9) which
underlines again that the athlete was
training in excess of power. (Hillerin, J.P.,

While preparing the corresponding power-
excess-scale, results of all means used in
that period are evolutionary, in AA 100m to
reach a result of 12.8, from 11.6, achieving a
growth of 9.06%. A repetition of 500m,
from 1,25-1,15 min, progress to 8%, while
the five steps take off one foot increase is
4.87% and the five steps take off jump(both
legs) results were increased marginally by
1.1%. To repeat at the 300m, progress
amounts to a value of 5.06% (from 44.5s to
37.8s.). Correlation between the results
obtained in training the 100m and the
distance from the five steps take off jump
test is insignificant at p > 0.05.

For further development of the athlete
O.D. is known, (56.78 s) in the first contest
of the season-Cup "Constantin Craiu")
believe that excessive power has been led
to stagnation results on five steps take off
jump place and prevented from obtaining
higher results in the next period. Analysis
of this period may be subject to other
scientific papers.

4. Conclusions

Analysis results show that the progress
recorded parameters is almost linear
between 8.33 percent and is registering
10.6%. The event five steps taking off
jump there was no progress, as confirmed
by recordings made by MGM (Miron
Georgescu Modified), where the power
(number of tones of training was
excessive). During programming before
competition period power (with excess
weight) there must be more discerning,
because further development of the athlete
during the competition depends on the load
(optimal and necessary) incurred by an
athlete during this period. We recommend
testing athletes in terms of power on
MGM, where possible, to have
permanently controlled explosive power
capacity required for every training athlete.

References

1. ADEYANJU, K., CREWS, T.,
speeds of isokinetic tracksuit on
muscular strength, power and
endurance. Journal of Sports Medicine
and Physical Fitness 23, 352-356.

2. BENNETTE, S. 1999, Sprint Training
Ideas 100 m, 200 m, 400 m
, Edited by
Sports Speed Dintiman, Ward and
Tellez, USA.

3. DELECLUSE, C. (1997) Influence of
strength training on sprint running
performance. Sports Medicine 24,
147-156.

4. DOWSON, M., N., NEVILL, M., E.,
LAKOMY, H., K., A., NEVILL, A.,
Modeling the relationship between
isokinetic muscle strength and sprint
running performance. Journal of
Sports Sciences, 16, 257-265.


8. www.donnamaria.ro